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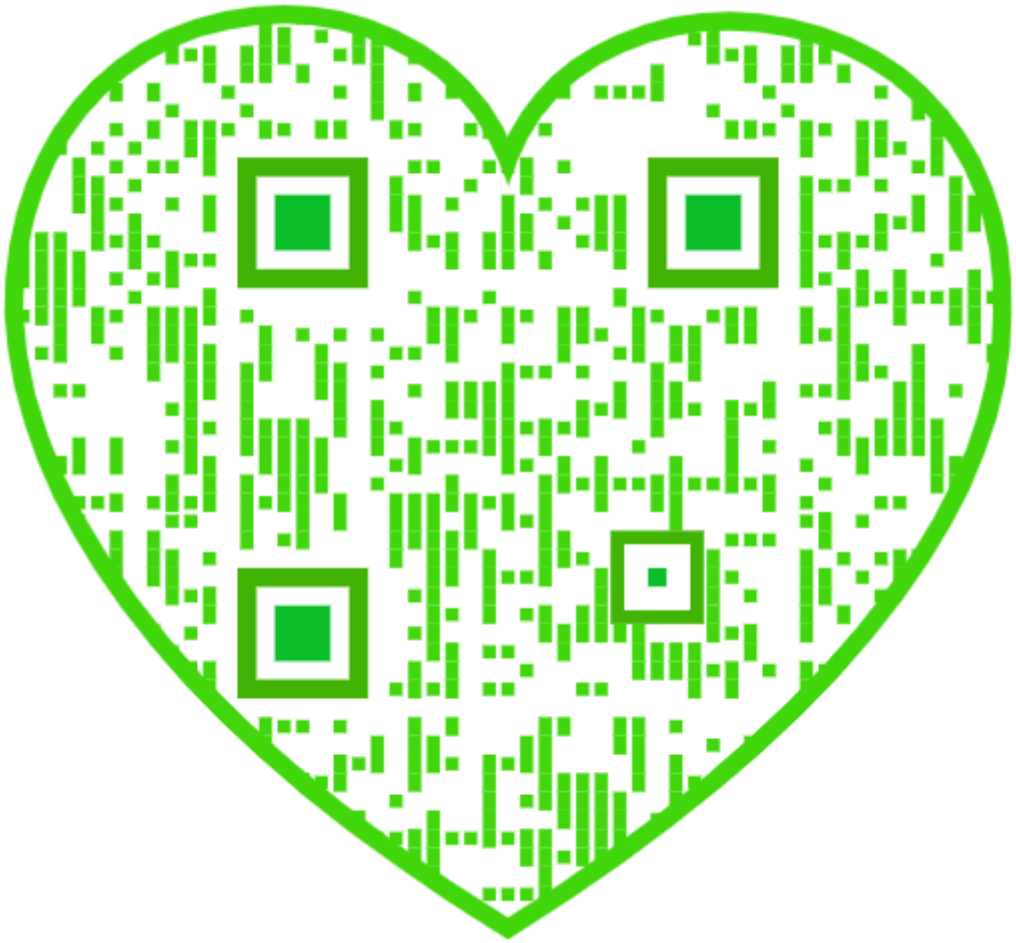

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UNITED STATES OF AMERICA.

DURAND'S

Strawberry

CULTURE.

INSTRUCTIONS

IN

Strawberry Culture,

BY

E. W. DURAND,

OF

IRVINGTON, ESSEX COUNTY, NEW JERSEY

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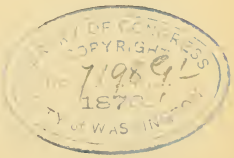

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TO THE PUBLIC.

Having so frequently been solicited for articles upon Strawberry culture, I have concluded to give the results of my experience in as brief a manner as possible, consistent with the necessities the matter may demand. I herewith present this little Book, hoping it may meet with approval, and satisfy the requirements of the Strawberry public, not only as a source of information to growers generally, but as a guide for the novice from the beginning to the end.

In the whole course of my experience, I have been almost entirely self-reliant; not to say that I am vain enough to suppose the experience of others worth nothing in comparison; but having listened, at the start, to so many conflicting theories, which not only served to puzzle and mystify me to such an extent as to leave me more in the dark than ever, as to any definite course to pursue, but impressed upon me the necessity of experiment, in every possible direction, in order to arrive at any just conclusion.

Having pursued this course persistently for the last seventeen years, cultivating both for the market and family purposes, combining and experimenting with manures, in different soils, and under various circumstances, forcing upon myself a mass of ma-

terial, and entailing an amount of labor that few would be willing to endure for the value of the knowledge gained. The necessities have been such as to throw nearly the whole labor upon my own hands; finding it next to impossible to procure such help, combined with a conception of the proper conditions and essentials. In order to avoid the muddle that hired intelligence would have subjected me to, I have had to endure an amount of physical and mental labor, that had it not been for knowledge of both the necessities and attention to the same, I should have broken down under the strain long since. Not only in the preparation and care of my beds for the cultivation of hundreds and thousands of new varities, and incidentals as above mentioned, that being but a fraction of the whole; but in originating seedlings from which vexatious trials and troubles in combination, and necessities in way of experiment, and labor of the brain, none but those pursuing a similar course can comprehend.

My intention at the commencement of this work, was to give results in way of originating seedlings as well as in cultivation, but finding it would be more of an undertaking than would be consistent with the time and necessities of the occasion, I have concluded to give such experience in similar form at some future time.

In these few lines of general instruction, no pretense is made in a literary way, as regards development of any peculiar theory, or nice flow of technicalities: such not being necessary for the purpose

of instruction in respect to cultivation of fruit; but simply as presenting such instruction as the necessities may require, in a plain and comprehensive manner, avoiding all those (to some), indefinite terms as may only serve to puzzle and mystify those seeking such knowledge in an ordinary way, and consistent with common sense.

Having honestly given the results of my experience in such a manner as all may easily understand, I leave it to the community to judge how far I may have been successful by my productions of such fruit, now and in future, to be presented to a discriminating public.

E. W. DURAND.

STRAWBERRY CULTURE.

In explanation of the following, I may acknowledge that my experience has been mainly upon clay soil, in some cases inclining to sandy loam, never in any case cultivating extensively upon strictly sandy soil, arriving at conclusions on such soil by experiment and observation, confirmed by the experience of prominent cultivators. When preparing for any particular crop, it is well to understand the necessities and requirements in every particular, in order to see your course clearly, pursuing it unhesitatingly and intelligently, leaving no stone unturned that may assist in arriving at a successful termination. With this end in view, I present such instruction as will, with proper attention, invariably lead to satisfactory results, and reward those so engaged by such a return in a pecuniary sense, as will leave no cause of complaint for following faithfully the path pointed out. As in many cases cultivators pay but slight attention, I would impress one thing upon the mind, that it will be necessary, at the start, to understand thoroughly the nature of the soil with which you have to deal. As for Strawberries it will follow, as an invariable rule, that beyond a certain degree, soils made light will not answer, especially when made so with horse manure, or any light, fibrous material. Of course, under such conditions, it will not do to apply immoderate quantities of light manures to soils that are naturally light in them-

selves, or made so by previous cultivation. All soils in proportion as they may contain sand or light vegetable material, must be manured accordingly. As near as may be possible to judge, I would recommend it applied as advised, allowing the largest quantity mentioned to stiff clay, and using in moderation as you approach sand, or light soil of any kind, say but one quarter of the greatest allowance, and that of the kind recommended. Of course, it is apparent to all that clay will retain and absorb immense quantities of such material, and last or remain in proportion, while as they incline to sand they are more rapidly exhausted. We may now proceed with the matter in hand.

AS MANURE AND ITS APPLICATION

Is of great importance, and one of the first essentials, I propose to give the necessities in way of management and distribution. That I have always been, and am still, of the opinion, that compost is most desirable, yet in extensive cultivation it entails too much labor in way of collecting the necessary materials, and the construction of the heap, in order to be complete in way of variety, still for those merely cultivating a family bed, I should certainly advise it. I prefer in all cases to use cow manure as most reliable.

The preparation I would advise for compost would be cow manure as a base, as an absorbent I would employ the sediment of a fish pond, muck, sweepings from the city streets, or even rich deposits

of sand and vegetable matter frequently found by the road side.

Commence with a layer of four or five inches of cow manure, upon that an inch or so of the absorbent dirt or muck, upon that a sprinkling of bone dust, upon that a layer of night soil, contents of sink, or garbage of any kind, upon that a layer of absorbent, and so on until the heap is complete, or as high as may be desired.

If wood ashes can be had, use freely with the dirt or muck, covering it with an extra layer of the same, as it throws off ammonia from the manure when in contact with it, it is well to use a sprinkling of plaster with the muck or other absorbing material, in order that you may be sure of retaining all gases that may be likely to escape.

Upon this heap, when complete, throw all slops from the house, if convenient, and allow the heap to remain for fifteen or twenty days; then turn it over, mix thoroughly, put a layer of the absorbent on top with a sprinkling of plaster, and in a few days it will be ready for use. If the compost is not convenient, use, unhesitatingly, cow manure, never resorting in any case to that of the horse, in way of preparation for immediate planting. Although in many cases a bed prepared with well rotted horse manure may be a very successful operation, yet with a long experience of its uncertain results, I would, in my own case, never attempt it again. I have frequently examined plants from a bed set out after being prepared with, as I supposed, well rotted horse manure, and have found the roots

blackened or burned entirely off by contact with it. Not so with that from the cow. You may find plants growing in a mass of fresh manure of this kind, with roots as fresh and bright as possible, and when compelled to do so, have manured beds heavily with fresh cow manure just previous to setting out, with great success, yet I do not advise it, except where time is out of the question, and the necessity is upon you. We now come to

THE PREPARATION OF THE GROUND,

As in this lies the foundation for a successful crop, care and attention should be given to the matter. If possible take it in hand at least one year in advance, or previous to the time you propose setting out your plants. First in order is the

AMOUNT OF MANURE REQUIRED.

You may apply at the rate of from fifty to one hundred two-horse loads to the acre for heavy clay soil, divide for three ploughings, using the greatest proportion at the first ploughing, which should be in the spring. Harrow and allow the weeds to sprout; when of sufficient height, plough again, and be sure you allow none to go to seed to give you trouble in future.

In the fall plough again, using more than half of the remaining manure, reserving the last and smallest proportion for the next spring, which should be ploughed in as early as possible.

If the ground is stony, to save trouble in cultivation, it would be well to remove them at each ploughing.

Your ground is now ready, with the exception of about five hundred pounds of bone dust to the acre, which I would advise distributing at the ploughing that is necessary before setting the plants. It will be well here to give an idea of the best manner of

PREPARING THE PLANTS.

The general way is to allow the runners to take root anywhere; but the careful cultivator distributes them carefully and evenly, making each one stationary by putting a small stone or lump of dirt upon the vine, as close as possible to the leaf, at the base of which it takes root at its junction with the ground, previously making the ground soft and loose that they may grow more rapidly.

In many cases where you have fast growing, strong plants, it is better to set them for making runners the spring of the same year you intend setting out, in order to get them more vigorous and uniform. My plan is to select the first good runners, lay them in carefully, when fairly rooted, separate, and place in rich soil about two feet apart. They will make uniformly strong plants that will do to set early in August, and even before that time.

It is only with certain vigorous plants that you can operate in this way, but where it is possible, it is desirable, as your plants will not only be more

vigorous and regular, but will give you berries of larger and more uniform size than by any other process. In any case lay your runners in by making them fast so the wind may not move them, with sufficient room for each, and leave them for the rain to start, or if you are in haste, and not operating upon too large a scale, you may facilitate matters by sprinkling with a watering pot, until the ground is quite wet which will answer the purpose equally as well.

Your runners should invariably be produced from single plants, or rows not over one year old, as the importance of strength and vigor cannot be too strongly enforced, as it frequently makes the difference between a paying and a non-paying crop. We may now prepare for

TRANSPLANTING.

I have always been an earnest advocate of setting out plants early in the season—I am yet impressed with the importance of so doing, as I have invariably been successful when pursuing this course—the last of July or first of August, or even sooner if strong plants can be procured. You gain nothing by setting plants, not sufficiently matured, and in any case set none at all, rather than those that are weakly, as you may rest assured they will never repay you for your trouble.

THE DISTANCE OF THE ROWS APART

depends upon the kind of plant, and the time of planting; also the use you intend making of the

bed the second year. As regards economy, I would advise setting single rows, not more than two and a half feet in width between, for large plants, while for those of naturally small growth, two feet will be found sufficient.

Of course, the distance will be varied by circumstances, as where space is of no account and labor not considered; and again, in gardens where ladies may wish to gather the fruit, such distance would not afford sufficient room—as crinoline is a difficult thing to handle in contracted rows—under such circumstances three or four feet might be desirable. Yet in cultivating for profit, the narrow widths are to be preferred as entailing less labor in proportion to the returns.

THE DISTANCE OF PLANTS IN THE ROWS

must now be considered. It being a matter requiring change under various circumstances. It is well to understand the plant or plants you may have under cultivation, and ascertain, by trial, their performance as planted close together, or some specified distance apart. Serious mistakes are continually made in regard to this matter; many kinds being placed fifteen or twenty inches apart, when in fact each plant would bear nearly as many berries within three or four inches of each other. There is the greatest possible difference in this respect—some bearing as many berries each, when crowded, as when standing alone; while there is the greatest change in others. As an instance, I have gathered

from a row of Late Prolific's of 32 plants, 15 inches apart in the row: 28 quarts. Crowd one hundred in the same space, and you would not get five quarts from the whole row. Then, again, it is just the reverse: one called the Brilliant, gave a splendid crop when close together, while separately they were moderate bearers. And so on indefinitely, there can be no general specified distance.

You must be governed by your plant, the condition of the soil, and the quality or quantity of fruit you may wish. If your object is a great crop, and your ground able to bear it, select a plant that will endure confinement, and place closely together in the rows. If you wish large fruit give more room, and use younger and more vigorous plants; and as a general rule, the later in the season you set them out, the closer you may place them together.

In transplanting, be careful as to

DEPTH OF SETTING.

Plants should never be set with the crowns below the level of the ground, or in condition to allow the heavy rains to cover them with dirt; as it will frequently destroy them altogether. You will find a small leaf near the crown of each plant, which as a general thing will furnish a criterion as to depth. If you are setting out upon a ridge or elevation, you may set a little deeper to allow for washing away of the earth by the rains; but if setting upon a level—which I should invariably advise—be sure not to get below the surface especial-

ly in heavy soils. There is always at the time of setting plants

DANGER FROM DROUGHT,

From which there is no safe-guard; but if you set your plants early, you are in time to re-set in case of failure.

If it so happens that your plants should be seriously injured from this cause, it would be well to replace them with those fresh and vigorous.

If the ground from which you take your plants appears soft and loose, you may remove each plant with a trowel full of earth, allowing the roots to remain as nature placed them.

If hard and compact, forming a solid ball of earth, it will be liable to remain so and retard the growth of the plant. In case of this kind of trouble, it will be well to let them remain until a cloudy or wet day, or wet spell of weather, and set them without any soil at the roots, and bear in mind that the later you set them out the closer you may place them together.

SETTING PLANTS IN SEVERE DROUGHT

is frequently a necessity, some of my very best beds have been set in this way. At such times be careful to disarrange the roots as slightly as possible, allowing the earth to remain on them. Set at the same depth or slightly deeper, and press the whole firmly together, but not too hard.

It is presumed your ground is in condition to receive the plants, that is, the manure distributed thoroughly through it, in the manner previously advised.

The practice of setting plants over trenches, or making a hole and filling with manure, and placing the plant upon it, cannot be too strongly condemned, even well rotted manure will seldom be productive of good results.

MANURING IN TIME OF SETTING PLANTS

Should never be resorted to in summer; early in the spring or late in the fall it may answer, but never in dry weather. In summer it is almost invariably detrimental, and under any circumstances, should never be attempted.

When setting the plant, if not very wet weather, it is well to wet thoroughly around the root, say half a pint of water to each, and the same quantity should be applied daily, morning or evening, as long as they continue to wilt by the heat of the sun. If properly set as directed, they will soon recover and do well; if not injured by severe drought. You are now to give them the required

CARE AFTER SETTING,

Which should be given as soon as weeds or grass make their appearance. You may proceed with the hoe, rake, cultivator, or even plough, if nicely handled, before the roots spread much. My own course

has been to rely entirely upon the hoe and rake. I do not like disturbing the ground after the plants are set, yet it is frequently done with good results. For my own beds, I much prefer the hand cultivator to that of the horse, as I do not fancy rough cultivation.

As soon as the slighest start of weeds is apparent, a few days after setting the plants, rake the whole bed over, removing all stone and rough material, which will leave it in good condition for future cultivation; destroying, by this leveling process, the young weeds and grasses, that if allowed to remain long become dangerous; not only by robbing the plant of its nourishment, but by loosening the root by their removal, especially when making their appearance close to the plant, in which case they should be immediately and carefully removed by the fingers.

If your plants are injured, or stunted by severe drought, it is better to remove them, or such as may be necessary, replacing them with fresh vigorous ones, that will well repay you for the extra trouble. In this case will be found one great advantage of early setting.

LATE SETTING OUT

May sometimes produce a very fine crop, I have lately seen a superb crop from plants set between the 10th and 20th of October, yet I would never advise such a proceeding; as under unfavorable circumstances you are likely to fail, especially in such

soils as are likely to be affected by frost; as ground of this character not fairly settled heaves badly, throwing the plants out in a wholesale manner, especially when not well rooted. All beds in this condition should be protected by carefully covering before cold weather affects them; as from this cause alone your plants may be entirely destroyed. In all late setting, for after cultivation—in displacing weeds—do not disturb the ground more than is actually necessary; use the hoe and rake as lightly as possible, allowing the ground to settle and become compact, as the limited time will allow, as plants in loose or freshly worked ground invariably suffer most from the action of frost. We may now pay attention to

MANURING FOR WINTER.

It should not commence too soon, especially when using fresh manure; as uncombined ammonia is liable to injure the plants. If the weather should be cool, you may commence in September, if not, wait until it is.

You may commence by applying a small quantity of bone dust, say a small hand full to each plant, if ten or twelve inches apart—if closer not quite so much—distribute near the plant, and cover lightly with earth, or throw some absorbent, such as powdered peat or muck over it. You are now ready for

HEAVY MANURING.

Which, if cow manure or compost, may be used to almost any extent, care being taken not to cover the plant.

Horse manure may be used for this purpose, especially in heavy soils; but in all cases I prefer that of the cow spread between the rows, close to the plants, under the foliage if you wish, but not over it. My plan is to spread rapidly between, without touching the plants, from two to four inches in depth. You are now prepared for

COVERING FOR WINTER.

For this purpose, you may use either of the following; partially rotten hay, or bedding from manure, or combination of the same, with saw dust; or exhausted tan bark; such as the refuse of an ice house; salt hay; sawdust pure; or if judiciously used fine horse manure.

Partially decomposed hay from horse manure I prefer, as being mixed more or less with the manure, makes an excellent non-conductor of heat, and yet leaves a sufficient circulation of air to prevent the plant from receiving injury, as is frequently the case from being too closely covered.

In the spring there is no necessity for its removal, as it will break up under cultivation with the hoe, and yet act as a mulch to protect the fruit from being injured by dirt in case of heavy rains. I seldom resort to any of the long kinds of covering,

as I object to its removal in the spring, and the necessity of spreading again before the berries are ripe, in order to keep them clean, making a material addition to the labor. Saw dust, exhausted tan bark, or fine horse manure may be used, but it will require an extra amount of fibrous material to keep your berries out of the dirt in the spring; as covering of this kind will mix more or less with the dirt in cultivation, and spatter badly with the heavy rains.

Caution must be used in applying tan bark, as it frequently contains poisonous matter in combination for the purpose of tanning; it would be well to let it remain exposed to the rain for a year or so before using.

Salt hay may be considered the best covering where no objection is made to its removal for cultivation. Of course, under the horse arrangement, all covering of any length of fibre must necessarily be removed, and as this material does not fill the ground with seed, I consider it preferable. Aside from such objection, any fine fibrous vegetable material will answer.

Where the plants have been allowed to run together in the rows, the best covering is fine horse manure sprinkled over, leaving the plants partly projecting through, as when so situated they are, in a degree, self protecting, and as the fruit is seldom so heavy in proportion, and consequently self-supporting, it will need but slight mulching on the outer edges of the rows to protect its fruit from the dirt. I have beds of strawberries between my rows

of pear trees, that nature attends to as nicely as may be desired. When shedding the leaves in the fall, the wind distributes them around the plants, forming a perfect protection. But I would advise the use of leaves in no other way, as they will mat over the plants in such a way as to prevent the air reaching them, in which condition they are almost sure to perish.

THE TIME FOR COVERING

Is just before the ground begins to be affected by frost, as considerable harm may be done to small plants by slight freezing; especially in moist ground, or that recently worked, which if effected seriously, should be under-drained, previous to setting the plants; allowing this precaution has not been taken, paths or ditches should be made at least one foot below the surface of the bed, not over 20 feet distant from each other, running parallel, with sufficient fall to relieve the bed of all surplus water, and emptying where the wash of the bed may not be lost. The bed being now prepared for winter, may rest until neeessary to receive

ATTENTION IN SPRING.

Which is required as soon as the plants raise their foliage sufficiently to disturb the covering, which may be brushed off the top to relieve it. But where removal of the covering is proposed, and the necessity for cultivation becomes apparent,

by the growth of weeds and grass, the cultivator or spade may be used; but my invariable rule is, to disturb the ground as lightly as possible. Yet I have seen both spade and horse cultivator used with seemingly beneficial results; and the same in regard to even ploughing.

By some the plan is adopted of spading in the manure, as a preparation for setting out the bed anew, as soon as the berries are gathered, which plan I have seen work remarkably well.

Yet I am constrained from my own experience, to repeat my former remark and conclusion; that all serious disturbance of the soil in the spring, is more or less injurious to bearing plants.

The simple necessity is apparent, of keeping the beds free from weeds and grasses, with as slight disturbance as possible. Our next attention is required in

PICKING.

As soon as the berry is fairly ripe, which is no easy matter to determine at times, it may be picked. Yet there is not only a difference of opinion in this matter, but circumstances dictate different courses; some varieties when seemingly ripe, and in just the condition to pick, will gain in aroma and sweetness by remaining upon the vines a day or two longer; while others will be entirely ruined by the same course. Black Defiance, for instance, may remain, after receiving its full color, for a period of ten days, and even longer, under the most trying circumstances, and lose but little of its aroma; while some

of the soft varieties will perish immediately upon ripening, and even before, in consequence of too much rain or heat, and in some cases, from rapid changes, incidental to the strawberry season. Of course, in such cases, the cultivator must be the judge of the existing necessities.

In many cases, careless and destructive pickers are employed. The berries are crushed by the feet, the vines are mangled and broken down, bearing stems torn off green berries and all, or twisted and broken, so that those remaining will not ripen, and the ripe fruit so crushed by careless handling, as to be ruined for market purposes, by the time they arrive at their destination. All troubles of this character must be carefully looked after by the cultivator, in order that the crop may be a success. And here let me remark, for the benefit of consumers as well as producers, that the strawberry should invariably be picked with the calyx remaining upon the berry, as nearly all lose their aroma in a very short time after parting with it. It is to the fruit, what the cork is to the bottle of champagne,

The crop having been gathered, preparation may now be made for

CULTIVATING THE SAME PLOT ANOTHER YEAR.

There are various dispositions in this respect, that of the least trouble, is to allow the runners to take root near the parent plant, making a row of ten or twelve inches in width, or more, depending

upon the width of the original rows. Another is to run a small plough between the rows, making a furrow large enough to receive manure, without throwing the dirt over your plants. Fill the same with compost or cow manure, level the dirt over it, and it is ready to lay the runners upon.

A better way is to remove every other row; then prepare the vacant space by ploughing and manuring, as directed, allowing the remaining rows to make beds of plants, two feet or two and a half wide, according to the original width, by laying or distributing the runners over it, or laying them in.

In preparing beds of this kind, after the new plants are well rooted, you are to take out the old plants, while the space occupied by them, serves as a path between the new ones. It is always well to remove the old plants, after they have served the purpose of making new ones.

If as before proposed the original rows were two, or two and a half feet apart, and well manured for winter, if you prefer, you may fork the manure in between the rows, allowing the new plants to occupy the new space, the same as when running the furrow and manuring.

Of the two plans, I much prefer the latter for small beds; having adopted this one for the last few years, and found it very successful. By keeping the rows very narrow, almost to a single row, you may continue in this way for years, manuring between the rows for winter, and using bone dust as before advised.

Yet when cultivators prefer, as I do, the largest

berries, it is better to use new ground each year, making the bed, as at first proposed, one year in advance, and setting single rows.

This plan I should invariably pursue, if I had facilities for so doing, as the ground is left in superb condition for anything, and you may return to it, in a year or two, if properly treated, with every prospect of success.

One objection, and a very serious one, is that grounds occupied by strawberries, year after year, are liable to be infested with the grub, or insects peculiar to the plant, destroying them to such an extent, as to seriously interfere, and sometimes, as in case of severe drought, ruin the whole bed. For which reason, and the favorable action of new ground, I prefer a new bed each year. We may now pay attention to

PLANTS AND THEIR PECULIARITIES,

Of which it is well to be able to discriminate, as to their liability to thrive under the circumstances in which they are placed. The first of which we will denominate the

RAPID GROWER,

It is the one adapted to heavy soils, such as blue and yellow clay, that sometimes require stimulants, being always retentive, and often sluggish in action.

As all soils of this character, require a rapidly maturing plant; it will be well for the cultivator to

step carefully before venturing too far, and be sure of the adaptation of the plant to its position. The want of such knowledge, being a frequent cause of failure. It being advisable in any case, to test various kinds in comparison, upon a small scale, for two years, before planting extensively, as in many cases valuable plants will not accommodate themselves to the sudden change in soil and climate, that is required by removal under widely different circumstances, in so short a time as one year.

It is unfair and unjust to suppose, that a plant must do well when removed to conditions directly opposed to those of previous years of occupation, and to which it had become adapted.

In many cases, what might prove the most valuable of all, is thrown out and condemned, simply because it did not do well at the first trial, which in nine cases out of ten, may be attributed to some other cause than the right one. The experienced cultivator may be able to determine in a short time, the requisites of a plant for a new position. If he finds it a rapid grower, making strong vigorous foliage, and a stout crown, or additional ones as scapes, he may be satisfied, so far it is right; if its performance in way of fruit is satisfactory, that is generally sufficient. Still it may not give such results the first year, and yet perform splendidly the second or third year; and even those that are satisfactory at first, may not always remain so, depending upon material sometimes in new ground that may be easily exhausted, and difficult to supply. It is

always well to test new plants in various positions, before conclusion.

COLD CLAY SOIL.

As a general thing, rapidly growing vigorous plants, are a necessity in a soil of this character, while a slow grower may do wonders in a light rapid soil, in a warm climate, and bearing immense berries, it may become worthless in a cold slow one, making at the start, little or no preparation for fruit, being stunted and worthless in both fruit and foliage. Again I have seen the most reliable varieties in clay soil and cold climate, when transferred to light soil and a warm one, run to excess of foliage, and produce nothing in way of fruit.

The only way of getting at the matter properly, is to try various kinds, giving sufficient time to adapt themselves to the necessary changes.

LIGHT SOILS.

It is frequently the case, that plants are condemned as being weak in light soils. In my various experiments in order to test the peculiar effects of different manures upon plants, I have frequently had my attention called to the evil effects of making the soil too light and porous for strawberries.

Finding those placed in a bed made very light with horse manure did not do well, I at once suspected the cause; the plants appeared weakly, and would make no foliage, although considered vigo-

rous growers, upon removing them, I found they had made immense roots, and although I had raised the finest crops previously in the same bed, I found it useless to undertake to get fruit, or even respectable plants, from it for years after.

Not being fully satisfied in regard to the matter, I set various plants near my stable, where the soil had been made exceedingly light with the same material, notwithstanding it was originally a heavy yellow clay; although very rich, the foliage would not grow.

I allowed them to remain one year; upon removing them by pulling them up, I found the roots came easily out of this light, feathery material, and while the plants were yet in my hand, the roots were still fast in the ground, eight feet distant, and how much longer they may have been, I did not take the trouble to ascertain, that length being quite sufficient. The only conclusion that could be arrived at was, that the strawberry requires soil that will cling closely to the root, that its absorbents may be able to act. And so frequently has this same trouble presented itself to my notice, that I am thoroughly convinced, and have been for years, that all soils made light with excess of vegetable fibre, are unfit (while in such condition), for strawberry culture.

SETTING PLANTS IN LIGHT SOILS.

It is generally on account of the trouble last mentioned, that cultivators insist upon setting

plants in the spring, finding it almost impossible to make them root in warm weather. In this case, the plant is enabled to sustain itself, under moderate warmth, and sufficient moisture, where it could not endure the heat and drought of summer, and the young plants upon which the crop depends, are supported by the parent plant while rooting. In all cases where plants are

WEAK IN FOLIAGE,

And still remain so, after having sufficient time to adapt themselves to their new position; I would not advise their use to any great extent, until satisfied more fully of their endurance; although you may at first, under favorable circumstances, get a fine crop of large berries. Yet such plants are not to be depended upon; frequently (not in all cases), being deficient in vitality. Before condemning such plants, be sure the fault is not your own, and that your soil may not be deficient in material, necessary to sustain them.

NARROW LEAF OR SLENDER FOLIAGE,

Such as have long, light leaf stalks, should be thrown out in any case, as detestable under any circumstances, being unable to endure wind or storm, lopping down, and exposing the fruit, to both sun and rain. Even under favorable circum-

stances, when ripening fine fruit, they are seldom reliable, and had better be dispensed with. Not so with

THE STOUT LEAF VIGOROUS GROWER,

They are reliable, if accompanied by a corresponding amount of fruit; being enabled by their great vitality to endure climatic changes, and guard their fruit, from both rain and sun, with a good, stout leaf stalk, defying the wind, and perfecting its fruit almost invariably. Yet such plants sometimes, have their drawbacks, and among them, is a disposition to an excess of

RUNNERS BEFORE FRUITING,

Or rapid running, which may be produced by using stimulants too freely, in which case, it is not to be considered a defect; yet when naturally disposed to do so, is a very serious one, absorbing its strength, and weakening itself, to such an extent, as to be unreliable under unfavorable circumstances. These latter are not, however, to be confounded with those able to endure the strain, and still maintain their strength; especially when bearing their fruit large to the end, and ripening it well. In such cases, it matters but little, at what time the runners may appear, and if in addition, the old plant maintains its original foliage, or throws up a new set of strong, vigorous looking leaves; depend upon it, that is

your plant for cultivation, and will generally be found perfectly reliable.

It is not always safe to put too much dependance upon

SLOW RUNNERS,

As it is frequently the case that they are deficient in vitality, and being exhausted by bearing fruit, do not possess sufficient strength to make them. When united with strength and endurance, accompanied by clean, unspotted foliage, long after fruiting, it may be considered an advantage.

I have been forced to the conclusion that plants possess

VITALITY AND ENDURANCE,

As they retain their foliage after bearing, and making new plants; but where the parent seems exhausted upon its making runners, and as the foremost advance, those behind are found to languish, being unable to bear the strain of the new plant. You may be sure of one of two things; that your soil is sadly wanting in material necessary to sustain a naturally vigorous grower, or that you are cultivating a plant unsuited to your position.

Be sure your soil is not wanting in this respect, before condemning on this account. It not unfrequently happens, that the bed is completely exhausted by a heavy crop of fruit, which may have been perfected by stimulants, or sustained by some temporary allowance, such as light surface, or liquid manuring, or that the amount of manure in

the first place was insufficient. In the latter case, the most

RELIABLE PLANTS

Will drain the soil completely, searching out every particle of nutriment to perfect its fruit, and when its end is accomplished in that direction, and under such circumstances, it is very plain that the plant can no longer sustain itself; and such as might have shown vigor and strength, give out at once, with a feeble effort at self resuscitation.

Many of the best plants are condemned under just such circumstances, but few cultivators being aware of the amount of material necessary in the soil, to sustain plants bearing heavy crops of berries. This trouble is more apparent, and more likely to be encountered, in light soils, they being more rapid in action, or as I should say, the plants acting more rapidly, in consequence of facilities offered the roots for penetrating, and easily absorbing its food. The same result may be anticipated, and more surely encountered, by such cultivation in easily exhausted soils.

Many of our best and rapidly growing plants, require a rich, retentive, or clay soil, with the application of but little stimulating matter, and withal, it may be set down as an invariable rule, that all plants of great value, require

VERY RICH GROUND,

Being exhorbitant feeders, exhausting the ground rapidly, and producing in proportion, as they are

supplied with the necessary material. Serious mistakes are made in this respect, as some soils are deficient in carbon, and wanting in material to sustain and develop its fruit, and generally of a light character, and rapid in action, are wholly unfit for such purpose; while in such condition, and it is not unusual to see people apply bone dust, poudrette, or fresh horse manure, where stimulating matter is wholly unnecessary, and even hurtful, producing a luxuriant growth of foliage, with a scant supply of fruit. The crop being a failure, under such conditions, the plant is considered a worthless one by the cultivator, who in nine cases out of ten, is unable to determine where the trouble exists. We sometimes hear of fine crops of berries being raised upon

POOR GROUND,

Which may be rich in essentials for producing fruit, without sufficient stimulating matter to make a respectable show of foliage; the natural inference is, that the plant must be a fine bearing one, not disposed to run to vine. Frequently the whole plot will be exhausted in a year or two, and the advocate of poor ground cultivation is at a loss to determine why he succeeds so poorly under similar circumstances, on the same plot. It is easily perceived, that what may have been considered poor soil, and in reality is so for some purposes, is the most desirable for this one, and in most cases success may

be readily accounted for. Instances of this kind are not unusual,—as a spot may be selected, to all appearance as poor as possible, at the surface, underlying which is a bed or layer of peat or black muck, possessing an almost unlimited supply of fruit producing material; or what may have been the bottom of a fish pond, the surface of which may appear poor, yet remaining almost inexhaustible for our purpose. In such cases, the plant receives the credit, and is highly praised, while, under different circumstances, the same kind is condemned as unfit for cultivation.

An enviable reputation is sometimes gained for a worthless plant under accidental combinations, while some of great value may be considered as worthless from the same cause.

PLANTS AS EFFECTED BY CLIMATE.

The most valuable plants may suffer from severe and almost incessant rains, destroying or scalding their foliage. In view of the fact that such a state of things is unusual at the time of the year that we may expect dry weather, such quality may not be considered an objection, especially as such plants, generally, withstand the opposite extreme in way of drought. While those of this description may not do well for a wet and warm climate, yet would be the very thing to withstand the severe drought of our summers, making a good growth at the most desirable time; while a plant of the opposite char-

acter could not be depended upon at all, from its inability to endure dry weather, usual to our climate at time of setting out. These peculiar effects are mentioned that cultivators may not be over hasty in their decisions regarding plants as fitted for peculiar positions.

TESTING & CHOOSING FOR LOCALITIES.

A nice discrimination is required, by trial, of numerous varieties, to be enabled to select such as may be fitted by nature to occupy certain positions, giving the best returns in accordance with proper cultivation.

The cost being trifling, when compared with results, while those so engaged are laying the foundation for almost invariable success.

QUALITIES REQUIRED.

One of the most desirable qualities in any plant is endurance, or, in other words, strength and vitality; that may be manured to any extent, as before advised; possessing sufficient foliage to protect its fruit, making vigorous plants, capable of resisting drought; and making headway against minor troubles, and insuring a successful return in proportion to its proper cultivation.

Various qualities being desirable under different circumstances, each must choose according to the position they may occupy. One being far from market, may require a berry that will endure rough

carriage; while such quality may not be desirable to one near a market. Again, for family purposes, flavor might be the main consideration, and yet to an extensive cultivator for market, it might be considered as of no account,—the public, as consumers, having but little discrimination in this respect. And so on indefinitely, each must be the judge of the most desirable qualities, and be enabled to make such tests properly, and accordingly.

EXCEPTIONS.

Although, as a general rule, the most vigorous plant is the most desirable, yet there are exceptional cases. For instance, where an experienced cultivator is enabled, by being thoroughly posted, to manage a very valuable but difficult plant, possessing peculiar properties,—producing results beyond those less favored, by a knowledge of the necessities and conditions of such plants. And as I before remarked, people must choose according to the qualities they prefer. One may require a very rich berry to eat directly from the vine; another one that will remain a long time without injury, until they are ready to use it for the table, or to reserve to send away at stated periods; and I might continue in this way indefinitely, but of those preferable for particular purposes, each must be the judge of necessary qualities.

NEW GROUND PREFERRED.

The best results are almost invariably produced upon ground not before occupied by strawberries,

or at least for some years; for this reason I would advise those not well acquainted with all the requirements, if possible, to select space for a new bed every two years, not before so occupied; especially, where a great proportion of the largest and finest berries are required, with less trouble in picking, weeding, &c. Although the return may not be so great, in way of quantity, for market purposes, yet for family use they are much more satisfactory; and, if prepared properly in advance, there is not the same trouble in eradicating obnoxious weeds and grasses. Another objection to continuous cultivation is, that the ground is likely to become infested with that pest

THE GRUB,

from which I have never been able to protect myself, except by removal to another plot. It may not be generally understood that there are two distinct species of this pest, yet so much alike in appearance as to be a difficult matter to distinguish between them, the one apparently harmless, the other the greatest nuisance existing, as an enemy of the strawberry grower. The difference in appearance is that the destructive one being rather slender in comparison than the other, and although attaining nearly the same size, yet never quite so stout and bulky. The one living entirely upon dead matter; and the other entirely upon that alive. The non-destructive or harmless one, is

found in manure, while the other is making its ravages in the strawberry beds and grass lands, destroying the roots of both to such an extent, in time of drought, as to nearly ruin them, and would entirely, if it was not for their power of recuperation in making roots to replace those destroyed. For reasons of this character, I prefer setting out a new bed each year; especially, when desiring quality in preference to quantity; although doubtful if the new beds can be made to equal those broad rows of the second year in way of returns in cash. We may now notice the prominent or

GENERAL CAUSES OF FAILURE.

The first of which lies in the attempt to found a new bed upon an old one. Although

CONTINIOUS CULTIVATION

may be successful for years under certain circumstances, such as occupying space between the rows well manured and prepared by the winter's coat, as previously advised. The plants in this case occupy partially new ground, and are supported by the parent plant until firmly rooted. Not so with the old bed, ploughed or dug up and newly set with detached plants.

This plan should never in any case be resorted to, although there are instances of successful cultivation, among those thoroughly conversant with

the matter, yet as a general thing, nine hundred and ninety-nine in a thousand will result in failure. The most frequent cases of this kind occur in garden culture. So frequently the complaint is made "my bed in the garden did not do so well, though I manured and took the greatest pains with it;" and very often the best plants upon trial are condemned under such circumstances. Now my advice in regard to this matter is, if you can find no other place than an old strawberry bed to set out a new one upon, set out none at all, for, do as you will, you are likely to fail under the most favorable circumstances. Next in order is the trouble arising from the indiscriminate use of

FRESH MANURES

just previous to setting out the plants—and especially horse manure, and such as decompose rapidly, throwing off ammonia to such an extent as to suffocate the plant. Not only is the root destroyed by rapid decomposition or disorganization of such material, but the plant being deprived of sustenance that has been furnished by the parent plant, as soon as separated, is placed in a position to be ruined by contact with such gasses, as in its partially helpless condition it is unable to endure. It is easy to perceive the difference, in way of endurance, of a new plant while connected and drawing its nourishment from the parent, and one separated and thrown upon its own resources, as at such time,

the extreme heat is, in itself, sufficient for the plant to overcome, independently of such draw-backs as enumerated above. Another prolific source of failure arises from

MAKING THE SOIL TO LIGHT

with an excess of vegetable fibre, even such as muck or peat—which in a clay soil is invaluable, —is, in a light soil, of no value in most cases ; and where used to excess (in such soils) is detrimental, for the reason as before stated, that the strawberry root requires material that will cling closely to it enabling its absorbents to act effectually. The same trouble exists in the use of horse manure, especially in light soils—and even in heavy soils, when used to excess, is ruinous in its action for present purposes.

Yet when perfectly and thoroughly rotted, and becoming of a pasty consistency, the plot may again be used successfully. When in such condition time and trial can alone determine, as perfect disorganization varies materially under different circumstances. An old garden spot is generally in such condition, and if not previously occupied by strawberries, will give a superb crop. The same in regard to various pieces of new land, rich in both vegetable and mineral matter, will frequently produce astonishing results, leaving the novice to wonder why, with all his manuring, he has never been able to produce similar results since his first

trial. It frequently happens that sand occupies the surface beyond the requirements of cultivation, in which case, such are termed

LEACHY SOILS,

and may be considered the poorest and most unprofitable of all; yet if clay can be reached without great expense, they may be greatly benefited by a liberal supply of the same, and for lands of this character it is well to compost all manures with clay as an absorbent.

STIMULANTS IN WARM WEATHER

should never be used, especially upon poor ground, —where it is, apparently, most needed. The plants not being strong and of slow growth, the conclusion is they should be hurried or pushed ahead. When in this condition, they are unable to endure the action of the gasses arising from such material, and are consequently injured or destroyed altogether. Guano, night soil, fresh horse manure, or those that throw off ammonia rapidly, should be used with great discretion in warm weather, or not at all; even with absorbents they require to be used with caution, and are generally productive of more harm than benefit,—but may be used to advantage later in the season. My own plan is never to use them, except in very cool weather, covering them with some absorbent (as before advised) for sup-

plying the material required by the plant in the spring. Another great mistake is in allowing the

WEEDS AND GRASS

to make sufficient growth to injure the plant by their removal. If the ground is disturbed by the hoe or rake upon their first appearance, or while very young it will be found a very easy matter to keep them down, and retain the plants and bed in nice condition; but if neglected to long it not only entails greater labor, but may destroy your prospect for a fine crop, by disturbing your plants, proving such a laborious process, that you will wish you had never attempted raising a bed of strawberries at all, when by a moderate amount of labor at the right time all this trouble and irritation might have been avoided.

It is often the case that every care is taken to prepare a bed for the reception of

WEAKLY OR NEGLECTED PLANTS,

depending entirely upon the strength of the soil to make them grow. This is a serious mistake from which the cultivator should be carefully guarded, very often is it the case from this cause alone the crop is only one half, or one third, what it should have been, had the plants been strong and vigorous. I do not refer to young or small plants, if showing sufficient vigor, as they will often do

better than those left too long, but to those appearing weakly, be the cause what it may. I have invariably been successful in proportion as I have avoided

SETTING PLANTS LATE IN THE SEASON,

Although some kinds do not require the same length of time to perfect their germs as others, still it is best to give them all sufficient time, and by setting early you will be the gainer.

My best results have always been from setting my plants in July and August; although fine crops have been raised by setting as late as the first of October, I should never advise such a course, or pursue it, except as a matter of compulsion.

I have often heard this complaint; "I have set my plants out too early, they have got their growth and are failing." Indifferent varieties may do so, but first class plants never, unless material is wanting in the ground to support them; in this case, all are liable to such trouble, it being unreasonable to suppose, that strength can be sustained without sufficient nourishment. Again, you will find plants under favorable circumstances, to have made a superb growth, sometimes in an old bed, the result of stimulating; but when the time arrives for preparing their germs in the fall, will present the appearance of premature old age, either from exhausted ground, or from the fact of the necessary material to support it never having been applied;

and here let me caution all cultivators, against the excessive use of all

STIMULATING MATTER,

Such as contain a great amount of ammonia; or nitrogen in its various combinations. Among these as prominent, are guano, bone dust, some of those termed phosphates, hen manure, night soil, poudrette, urine, and all of this character, although very useful in their proper place, are detrimental when out of it, and may even become deleterious, when used to excess. They may be found very useful in heavy compact soils, cold and slow in action, and especially those well impregnated with carbon in any form, such as black muck or peat, or old manures, that may have lost a great proportion of its stimulating property, as is often the case with those not composted; when used to any extent in the last mentioned soils, may be accompanied by stimulants, and great advantages derived from their action. It is well, in any event before using freely, to be sure you have sufficient carbon in some form, in the soil, to keep pace with the growth of plant produced by the former. The invariable effect of excess of stimulants, (when the plant is able to endure them), is foliage without fruit, or in such proportion, as fruit producing material may accompany it.

ACID IN THE SOIL.

Soils of the last named character may contain acid in excess, and are termed sour, which is often the case

with low, wet, undrained lands. In the preparation of such for strawberry purposes, it is well to use alkalies in proportion as they may be necessary. Lime, wood ashes, plaster, &c., with thorough drainage, and frequent ploughing, may be made very productive.

It will sometimes occur, even under the best laid plans, that plants may suffer from intense heat, and sometimes be destroyed, the

EFFECT OF DROUGHT,

At the proper time for setting plants, we are likely to meet with trouble of this kind.

When setting plants in summer, there is more or less danger of continued dry weather; and as we are unable to determine when it may come upon us, it is best to prepare for such an emergency, by set- the plants as early as may be consistent with the strength of the new runners. In well prepared ground, with vigorous plants, the setting of the new bed may commence early in July, and continue until the first of September, if the weather will allow, it may be necessary to continue until cold weather sets in; but I should prefer to finish invariably by the first of September, if a large crop was the intention at the start. In case of failure of the plants by protracted drought, you may have an opportunity to reset in time for a good crop. With failure from this cause, in late setting, you are helpless. As before advised, when setting in dry weather, I prefer the plants with the earth around them, if

the soil from which they are taken be loose and mellow, if not, there is no alternative but to wait for wet weather, and set them out without the earth.

The greatest trouble I have had to contend with in setting new beds, has been the

GRUB DESTROYING THE ROOT,

And from which I have never been able to protect myself. Salt I believe will destroy them; but as danger exists of killing, or injuring the plants by its use, I prefer replacing those so destroyed, having found no effectual manner of exterminating this pest.

There are but few insects, aside from the one mentioned, that are troublesome, with one exception, they may be dispensed with as unnecessary of notice. This exception is a small boring worm, about the size of a small pin, half or three-quarters of an inch in length, of dark brown color. Its action is to bore through the crown of the plant, either destroying or injuring it to such an extent as to be unfit to remain. Fortunately this insect is not very numerous, and as no cure has been found for it, we can only supply the place of the plants destroyed.

CHANGE OF POSITION

may sometimes be detrimental. It is well, not only for this reason, but as a matter of convenience, to raise your new plants near your proposed bed, or

in similar soil ; it being well to determine in advance, if soil and plants are suited to one another, as too great a change may produce unfavorable results, especially when brought from a great distance—at times doing poorly at first, yet performing splendidly when thoroughly acclimated and and used to the soil. In preparing your bed, attention must be paid to drainage, otherwise your plants may suffer by the washing of dirt over them, or away from them, and also be in danger of being thrown out by the frost. Even if underdrained, if the position should demand it, provision should be made for surface water in excess, by such depth of path around, as the necessities may require.

PROTECTION NECESSARY FROM ACTION BY FROST.

In beds, properly prepared in well drained lands, there may be no necessity for protection from frost by covering with any material; the soil being sufficiently light and dry as to remain without heaving or throwing the plant above its original position, or out of the ground altogether. But this will not answer in clay soils, many of this character being the most retentive, and valuable for continuous cultivation, will need a good cover of from one half to an inch in depth, in order to protect them thoroughly. In many of these, with advantage in way of drainage, and with good cultivation, it might appear that no necessity existed

for covering in certain winters, from the fact of snow lying upon them nearly all the time, necessarily protecting them as nicely as may be desired. It may happen that a series of favorable winters will induce the cultivator to wholly neglect, or cover very slightly, as his plants has seldom suffered. While in such condition, a winter unfavorable from the absence of snow, and the effect of continual freezing and thawing, has stolen the march upon him, and being unusually severe and trying, upon examination in the spring he finds his beds nearly or quite ruined. For this condition of things it will be well to prepare, and if the nature of the soil is such as to be effected seriously by any winter, it would be safe to cover regularly and invariably, as even in porous soils plants are sometimes injured that are left unprotected, to a greater degree than many would imagine.

In those grounds where covering may be necessary, where the rows may be closely together, I would advise covering with salt hay, or similar loose material, over the whole surface, not only as being more effectual, but retaining its place better, being less liable to disturbance from wind.

Regarding the liability to injury in winter, it must be acknowledged, that light soils have an advantage in this respect; as but slight necessity exists for care at such time.

ADVANTAGES OF LIGHT & HEAVY SOILS.

It is no easy matter to determine which character of soil should be preferred for cultivation of the

strawberry, so much depending upon the natural advantages in certain localities for manuring, in way of procuring material peculiarly fitted to the plant, and its necessities.

In many respects the advantages lie on one side, while upon the other, they may be fully equal in certain respects, each depending in a great measure upon the surroundings and dispositions of those so engaged. While, for certain reasons as presented, I may prefer a stiff clay soil, yet I am well aware of the natural advantages of a light one, and shall endeavor to give, impartially, the credit due each.

For continuous cultivation, I prefer, most decidedly, a stiff clay soil: as the strawberry, in most cases, will require very rich ground, it is easily perceived that a soil of this character will absorb and retain a greater amount of material necessary to supply the demand made by such exhorbitant feeders; being very retentive, it seldom loses, either by evaporation or drainage, enabling you to apply manure almost indefinitely; without the evil effects arising from a soil too light; and as the most necessary material in its cheapest forms is light; it is apparent, that this matter must be limited in such soils.

In all cultivation of the strawberry, with the desire for a heavy crop of fruit, it is a matter of necessity, that the soil be well supplied with carbon, this material existing as the main component in black muck or peat, and the manure as before advised for general use; such being light in themselves when applied in such quantities as may be necessary

for the supply, and development of the berries, and continued cultivation. It may at once be seen that a large amount of such material would not answer in a light soil, as it is almost invariably a difficult matter to make the plants grow in proportion as the ground is made too light with it; and while such material may be detrimental in such cases, it is just the reverse in heavy soils.

Year after year, heavy applications may be made, and still the heavy clay may retain it without becoming sufficiently light and porous to interfere with the growth of the plant, and yet become sufficiently so to work pleasantly—continually improving in such respect—and when used no longer for this purpose, will be found to have retained all the material not exhausted by the strawberry. It is at once apparent, that for continuous cultivation with the expectation of heavy crops of berries that a clay soil is a necessity. On the other hand a light soil may be preferred by many for the ease and pleasure with which it may be worked, being less compact and more easily handled, generally producing a fine crop the first year, with much less trouble in the cultivation, and scarcely any danger of heaving or being destroyed by frost.

Still it must be born in mind, that rotation of crops is a necessity in this case. I would not advise the continuation of the same plot more than two years,—the first being well prepared with manure that will not lighten the soil to much, depending upon heavy mulching for the second year of cultivatition.

It may be considered as a certainty, that it is not safe to depend upon a crop, after the expiration of this term, in light soils. Yet in this, as in all others, there are exceptional cases, as before mentioned, by an almost inexhaustible supply underlying the bed, which may not be perceptible to those having but slight experience; and even to those that have, a combination of circumstances may produce such an effect as will sometimes puzzle the most experienced.

In conclusion let me repeat the one piece of advice most necessary—keep your beds clean and free from weeds and grass, by timely attention, and careful setting in time of drought, and proper attention to advice herein given, and you will be sure to succeed.

E. W. DURAND .

CONTENTS.

PAGE

MANURE AND ITS APPLICATION, 8

Compost.
Material necessary.
Construction of the heap.
Absorbents, use of.
Compared effects of various kinds.
The best and most reliable.
Fresh manure, the use of.

THE PREPARATION OF THE GROUND, 10

Time required.
Amount of manure required.
Application.
Ploughing, when necessary.

PREPARING THE PLANTS, . . 11

Laying in.
Strong plants, treatment of.
Healthy plants, importance of.

TRANSPLANTING, ... 12

Early setting.
Weakly plants, advice as to.
Late setting.

PAGE

THE DISTANCE OF THE ROWS APART, 12

Various widths necessary.
Economy in cultivation.
Large and small plants.
Family beds, width of rows.
Single or double rows.

THE DISTANCE OF PLANTS IN THE ROWS, ... 13

How to ascertain.
Trials necessary to determine.
Comparison.
Changes required.
Early and late setting.

DEPTH OF SETTING, ... 14

In heavy and light soils.
Setting too deep, danger of
Washing by rains.

DANGER FROM DROUGHT, . . 15

Injury from drought.
Manner of treatment.
Difference in loose and compact soils.

SETTING OUT PLANTS IN SEVERE DROUGTH, ... 15

Course to pursue.
Condition of soil.
Improper modes of setting out plants.
Manuring in time of setting out plants.

PAGE

CARE AFTER SETTING OUT, . . 16

Immediate care.
Manner of cultivation.
Caution in removal of large weeds.

LATE SETTING OUT, ... 17

Risk of drought late in season.
As effected by frost.
Precautions in covering.

MANURING FOR WINTER, . . 18

Time to commence.
Fresh manure too soon.
Quantity to use.
Applying bone dust.

HEAVY MANURING, ... 19

Quantity necessary.
Character of, for certain soils.
Manner of applying.

COVERING FOR WINTER, . . . 19

Variety of covering used.
Character of covering not removed.
Amount necessary.
Fine manures, when used fo covering.

PAGE

THE TIME FOR COVERING, . . 21

Small plants as affected by frost.
Late setting of plants.
Freshly worked ground.
In accordance with drainage.

ATTENTION IN SPRING, . . . 21

When required.
Removal of covering.
Preparing for cultivating another year.
Various courses pursued.

PICKING, ... 22

When to pick certain varieties.
Effect of rain and heat.
Retaining or losing aroma.
Careless and destructive pickers.
Necessity for the calyx on the berry.

CULTIVATING THE SAME PLOT ANOTHER YEAR, ... 23

Various courses pursued.
Removal of alternate rows.
Ploughing and manuring.
Removal of old plants.
Preparation for continous cultivation.
Best course for fine fruit.

PAGE

PLANTS AND THEIR PECULIARITIES, 25

RAPID GROWERS, ... 25

Necessities in heavy soils.
Effect of stimulants on such plants.
Adaptation to position.
Stimulating, when necessary.
Time required in change of position.

COLD CLAY SOIL, ... 27

Character of plant necessary.
Plants unsuited to certain soils.
Climate in connection with soils.
Combined action upon plants.

LIGHT SOILS, ... 27

Plants weak in light soils.
Effect of different manures in such soils.
Soils made too light with manures.
Plants expending their strength in root.
Experiments in light soils.
Character of soil required.

SETTING PLANTS IN LIGHT SOILS, 28

Time for setting in light soils.
Care required.
Endurance of plants in light soils.

WEAK IN FOLIAGE, ... 29

Change of position frequently the cause.
Often deficient in vitality.
Exhausted ground.

PAGE

NARROW OR SLENDER FOLIAGE, . 29
Reliability of this character.
Endurance of such plants.

STOUT LEAF, VIGOROUS GROWERS, 30
As accompanied by fruit.
General reliance.
Protecting the fruit.

RUNNERS BEFORE FRUITING, . . 30
Weakness of such plants.
When reliable.
As carrying out its fruit.
Foliage in connection after fruiting.

SLOW RUNNERS, ... 31
Various causes.
When reliable.
Under what circumstances desirable.

VITALITY AND ENDURANCE, . . 31
Deficiency in plants.
Judging unjustly.
Temporary or surface manuring.

RELIABLE PLANTS, ... 32
Exhausting the soil.
Want of proper nourishment.
Causes of failure of such plants.
Deficiency in light soils.
Character of soil required.

PAGE

VERY RICH GROUND, ... 32

Production in proportion.
Carbon required.
Stimulating matter, where necessary.
Causes of failure.
Unjust condemnation of plants.

POOR GROUND, ... 33

Deceptions in some cases.
Causes of failure.
Success accounted for.
Instances.
Accidental reputation of plants.

PLANTS AS AFFECTED BY CLIMATE, 34

Effect of incessant rains.
Endurance in drought.
Growth at the most desirable time.
Hasty decisions.

TESTING AND CHOOSING FOR LOCALITIES, ... 35

Nice discrimination required.
As fitted to occupy positions.
Returns in accordance with cultivation.
Comparing costs with results.

PAGE

QUALITIES REQUIRED, ... 35

Endurance.
Foliage for protection of fruit.
Resisting drought.
Qualities required under various circumstances,
Discriminating.

EXCEPTIONS, ... 36

Management of difficult plants.
Advantages of experience.
Certain qualities desired.
Individual preference.

NEW GROUND PREFERRED, . . 36

Reliability of new ground.
Largest and finest fruit.
Weeds and grasses.
Objections to continous cultivation.
Quality in preference to quantity.

THE GRUB, ... 37

Two distinct species.
Difference in appearance.
Where found.
Effect in time of drought.
Continuous cultivation of the same plot.

GENERAL CAUSES OF FAILURE, 38

PAGE

CONTINUOUS CULTIVATION, . . 38

General exceptions.
Detached plants in old beds.
Uniform failure, cause of.
Garden culture.

FRESH MANURES, ... 39

Uncombined ammonia.
Horse manure.
Rapid decomposition.
Effect of escaping gases.

MAKING THE SOIL TOO LIGHT, . 40

Excess of vegetable fibre.
Character of soil required by the root.
Results from new ground.
Perfect decomposition.

LEACHY SOILS, ... 41

How benefitted.
Composting for such soils.
Absorbent necessary.

STIMULANTS IN WARM WEATHER, 41

Plants destroyed in poor soil.
Manures detrimental.
When used to advantage.

PAGE

WEEDS AND GRASS, ... 42

How to destroy them.
Evil effects of neglect.
Trouble and irritation avoided.

WEAKLY OR NEGLECTED PLANTS. 42

A serious mistake.
Comparison of plants.
Small plants.

SETTING PLANTS LATE IN THE SEASON, ... 43

Time required.
Plants failing.
Indifferent varieties.
Premature old age.
Plants, preparing their germs.
Want of necessary material.

STIMULATING MATTER, . . . 44

Ammonia or nitrogen.
Manures containing a great amount.
When useful.
When detrimental.
As necessary to certain soils.
Effect when not accompanied by carbon.

PAGE

ACID IN THE SOIL, ... 44

Undrained lands.
Preparation of such for berries.
Use of alkaline matter.

EFFECT OF DROUGHT, ... 45

Early setting out, benefits of.
Time for setting out.
Failure from late setting.

THE GRUB DESTROYING THE ROOT, 46

The use of salt.
Replacing plants destroyed.
Other insects.

CHANGE OF POSITION, ... 46

Advice in regard to position.
Time required.
Accidental results.
Necessities in way of drainage.

PROTECTION NECESSARY FROM ACTION BY FROST, ... 47

Light soils as affected.
Effect upon clay soils.
Advantage of drainage.
Protection by snow.
Influence of favorable winters.

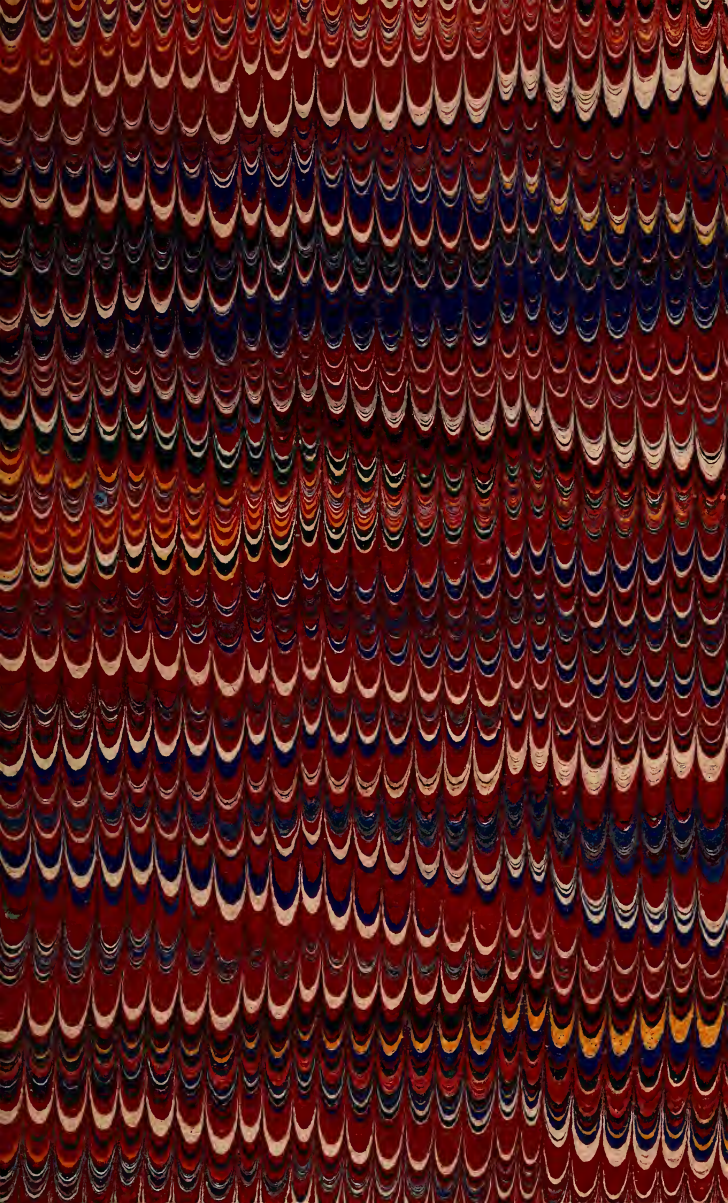
PAGE

ADVANTAGES OF BOTH LIGHT AND HEAVY SOILS, ... 48

Natural advantages of each.
Depending upon surroundings.
Clay soil preferred.
Reasons given for the same.
Carbon for clay soils, necessity of.
Difficulty from the same in light soils.
Effect of carbon upon clay soils.
Effect of carbon upon light soils.
Light soil why preferred by many.
Treatment, light soil, considered.
Light soil, continuous cultivation.
Exceptional cases.
Circumstances producing effects.

CONCLUSION, ... 51

Advice necessary.
Attention at all times.
As attended with success.



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